

# The Square Knot

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A publication to join in a partnership, with our  
customers, for world class healthcare



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## Questions?!?

## Give us a call

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## Preventing Mold Exposure Through Proper Design

**R**ecent reports in the medical literature and the popular press raise concerns about potential health effects from exposure from mold and mold products in indoor environments. Molds grow indoors if water leaks or lack of ventilation produce moist wet conditions. Issue of interest to health professionals are the mechanisms and effects of exposure and measures to prevent or ameliorate effects.

Health effects generally fall into four categories: allergy, infection, toxicity, and irritation (mucous and sensory). The various mold species, their metabolic products, the amount and duration of exposure, and a persons susceptibility all influence response. Susceptibility varies by age, gender, genetic predisposition, and concomitant exposure to other air contaminants.

**ALLERGY:** The most common response to mold exposure may be allergy, with reactions that can range from mild and transitory to severe and chronic. Atopic individuals may develop symptoms when their respiratory system or skin is exposed to mold or mold products to which they have become sensitized. The Institute of Medicine (1993) has reported that allergic rhinitis is the single most common chronic disease. Additionally, about 14% of Americans suffer from allergy-related sinusitis, and 10-12 % have allergy related asthma. However, a recent study by the Mayo Clinic (1999) suggested that fungal sinusitis might not be a purely allergic phenomenon. Researchers found numerous species of mold in

the nasal mucous of patients studied, along with eosinophilia and inflammation, but not Type I sensitivity.

**INFECTION:** Infection from molds that grow in wet indoor environments is uncommon except in susceptible populations such as those with immune compromise from disease or drug treatment. *Aspergillus fumigatus* can grow indoors and is a known source of Nosocomial infections among immune-compromised patients.

**TOXICITY:** Many molds can produce secondary metabolites such as antibiotics and mycotoxins that seem to give these organisms a competitive advantage over others growing in the same ecological niche. Mycotoxins are almost all cytotoxic, disrupting various cellular structures such as membranes and interfering with vital cellular responses such as synthesis of proteins, RNA, and DNA, and energy metabolism. Some mycotoxins have acute, lethal effects at mg/kg concentrations or less.

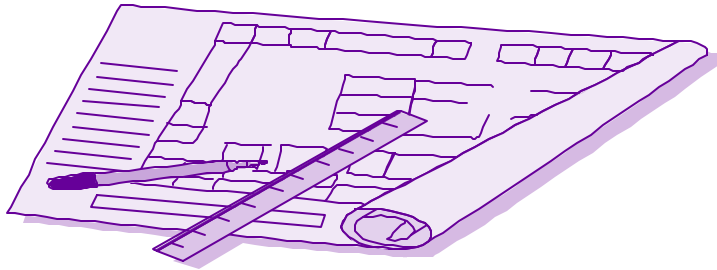
Aflatoxin (produced by several *Aspergillus* species) is among the most potent liver toxins and carcinogens. Trichothecenes, produced by such molds as *Stachybotrys chartarum*, *Memmoniella echinata*, *trichoderma*, *trichothecium*, and *Acremonium*, are among the most potent inhibitors of protein synthesis. Mycotoxins can directly affect route of entry (respiratory system, skin, digestive tract), or, if absorbed systemically, can affect the nervous system, the liver, the kidney, and other organs.

Toxins may have specific target organs or exert a more generalized effect.

The most effective way of  
preventing health effects  
from mold exposure is  
through proper design,  
site location, and  
construction of buildings  
to control moisture

## Molds...continued

People living or working in wet buildings contaminated with toxic molds can be exposed to mycotoxins via inhalation of spores, dust, or other mold parts, or via dermal contact with con-



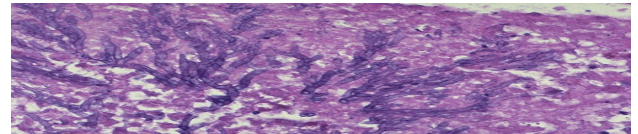
taminated surfaces. Several studies have reported that occupants of mold-contaminated buildings have increased susceptibility to infectious diseases. An association with bleeding from the respiratory tract in young infants living in damp and moldy homes has been reported, and continues to be investigated.

**EXPOSURE ASSESSMENT AND PREVENTION:** Assessment of exposure remains the most difficult aspect of determining mold related illnesses. Growth of mold is a dynamic process that

varies with available nutrients, level of moisture, age of cultures, and competition among microbes. Exposure in buildings is also variable, depending on location of the occupants, location of molds, and disturbances that can cause them to become airborne.

The most effective way of preventing health effects from mold exposure is through proper design, site location, and construction of buildings to control moisture. Once contamination has occurred, remediation of the moisture sources and clean-up of contamination is needed to prevent continuing health effects. Proper ventilation and dehumidification can also be used to aid in moisture control.

This article is courtesy of the Department of Health Epidemiology section's epiTRENDS, Volume 6, Number 1 issue.



Aspergillus fungus ball in a lung

## Designing for the Aging Eyes

The issue of the aging eye will become an increasingly important one over the coming years. The population as a whole is aging; we are getting older. That will require many necessary changes in how we plan for and design our interior and our exterior environment. For example, most lighting research studies have used relatively young sub-



jects. Almost all current recommended lighting levels have been established for young eyes. But eyes age, and many things relative to vision change for the older eye. Lighting levels must be amended, glare becomes much more important, and so on. It is critical to understand these differences and to allow for them. Check out these web sites: [www.darksky.org](http://www.darksky.org) and [www.afb.org](http://www.afb.org)

## Air Gaps for backflow protection

An Air Gap is a physical separation of the supply pipe by at least two pipe diameters (never less than one inch) verti-



cally above the overflow rim of the receiving vessel. With an air gap, there is no direct connection between the supply main and the equipment. An air gap may be used to protect against a contaminant or a pollutant and will protect against both back-siphonage and back-pressure. An air gap is the only acceptable means of protecting against lethal hazards. A typical example of an air gap found in nearly every home and facility is the gap between a bath tub faucet and the tub's flood rim. [www.waterboysprinkler.com/intro.html](http://www.waterboysprinkler.com/intro.html)

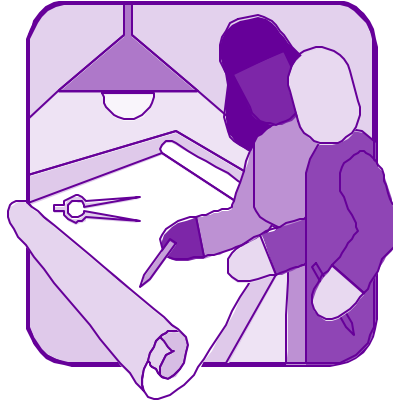
## You asked for it...You got it!

Your requests for more timeliness in reviews and tracking of your project through the system has not gone by the way-side. Construction Review Services has been authorized to hire three new staff members to better serve you, our customers.

The positions will be:

- \*One full-time Project Coordinator
- \*One full-time Plans Reviewer
- \*A part-time fire systems reviewer

The **Project Coordinator** will be a dedicated single point of contact for all projects. They will work with owners, administrators, local building officials, and design consultants to clarify the procedures required to obtain DOH approvals for construction. They will help track project throughout the review process to assure our customer have a complete and timely review and approvals.



The **Plans Reviewer** will provide supportive plans reviews for architectural, mechanical/electrical, fire and life safety, and environmental infection control. This reviewer will also assist licensing agencies with pre-occupancy inspections.

The **part-time Fire Systems reviewer** will review your sprinkler and fire alarm plans. They will also help keep-up with the increased work-load of sprinkler plans for the DSHS Sprinkler grant program. For more information on the grant program, visit our web site at [WWW.DOH.WA.GOV/CRS](http://WWW.DOH.WA.GOV/CRS).

We have a project coordinator, **Daniel Auderer** and a fire systems reviewer, **Rob Bradley**, on board. We are still seeking a plans reviewer. Please call **Chad Beebe** at (360) 705-6648 for information.

## Ceiling Construction in Healthcare

Molds and fungi can be harbored and proliferate in suspended acoustical ceilings along with other contaminants. The hospital regulation requires the use of ceiling material appropriate to the room it is applied. WAC 246-320-525 (6)(c)(iii) states: "Ceiling finishes or construction with... smooth surface without visible joints or crevices in areas where surgical asepsis must be maintained." With hospital's quest for more space to perform procedures additional rooms are being used to do more complex treatments and procedures. A cardiac catheterization room will also accommodate pacemaker implants and lithotripsy room being used for prostatectomies (TURP). You will need to work closely, with your architects, interior designers, and infection control staff, your intent for the function of new and remodeled rooms to be sure the finishes within the room will accommodate the cleaning methods appropriate to the procedures being performed in that room. The definitions of aseptic technique can be found in texts from the Association of Operating Room Nurses (AORN) and the Association of Practitioners in Infection Control (APIC). We will also be looking at this ceiling issue more closely along with the functional program for the room.

APIC's text discusses "Aseptic Technique" in their APIC Text of Infection Control and Epidemiology in chapter 27. Asepsis is defined as the absence of pathogenic (disease-producing) microorganisms. Clean technique refers to the practices that reduce the numbers of microorganisms or prevent or reduce transmission from one person to another. Sterile technique refers to the practices designed to render and maintain objects and areas maximally free from microorganisms. Both techniques discuss the need for: Handwashing (scrub), patient skin preparation, barrier protection, and appropriate environmental controls. Such as: Special rooms, controlled activity, ventilation, environmental surfaces, waste disposal, and reprocessing equipment.

[WWW.DOH.WA.GOV/CRS](http://WWW.DOH.WA.GOV/CRS)

# The Square Knot

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The Department of Health works to protect and improve the health of the people in Washington State

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## About this publication from Bart Eggen, FSL Executive Manager

Welcome reader to the first edition of the Square Knot.

This is a quarterly newsletter published by Department of Health (DOH), Construction Review Services (CRS). The intent of the newsletter is to provide information to our customers regarding new developments within our program and new developments within the various industries subject to construction review.

Each edition will have a section devoted to internal program developments including a report on the status of program identified performance measures, rule development activities that may effect facility construction standards, process improvement projects and personnel activities. Additional general interest articles will cover broad areas such as Fire Life Safety, Heating Ventilation Air Conditioning (HVAC) systems, Infection Control and other related topics. Also we are encouraging other DOH programs and our customer to submit articles, sharing infor-

mation that contributes to improved quality of health care facilities or services.

I am excited about the opportunity this newsletter presents for CRS to share information with our customers. I look forward to reading many quality editions of this publication, and I'm extending an invitation to all who receive the newsletter to provide feedback on the content and contribute articles for publication. I believe the newsletter is a viable approach to facilitating quality communication, which support all of our efforts in Protecting and Improving the Health of People in Washington State.

**The next Square Knot publication date is April 2002.**

**Our deadline for articles is**

**January 31, 2002.**

**Thank you for your interest.**

**Editor: [John.Templar@DOH.WA.GOV](mailto:John.Templar@DOH.WA.GOV).**

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